A CASE OF SUBDURAL HEMORRHAGE CAUSING ANOMIA, WITHOUT ANY OTHER FORM OF APHASIA.*

By GRAEME M. HAMMOND, M.D.

The opinion that there is a circumscribed area in the temporal convolution in which auditory word-image memories are stored, or, in other words, that there is a "naming center," has been vigorously upheld, and supported not only by strong arguments, but by seemingly convincing pathological evidence. On the other hand, there are many who strenuously deny the existence of such a center, and equally powerful arguments are presented in contravention.

The case I desire to present for your consideration is that of a young man, twenty-five years old, of fair education, and a clerk by occupation. He denies syphilis, and there is no evidence of his having had that disease. He admits that he drinks alcoholic liquors, but says he seldom does so to excess. His physician said he had observed albumin and granular casts in the urine for several months previous to his injury. These conditions were confirmed after his admission to the hospital. He was apparently in good health at the time he was hurt. During a fight he was struck on the left side of the head, over the temporal bone, with a loaded whip-handle. He was knocked down, but was not rendered unconscious. He was able to arise without assistance, and walked to his home. He did not have any difficulty in conversing for several hours afterward. At the end of that period he was suddenly seized with a general convulsion, which from all accounts was severe and prolonged. When he regained consciousness it was observed he had completely lost the ability to name objects and persons. He was brought to the Post-Graduate Hospital a few days later, where I first saw him. I had him under observation for several days, during which time his symptoms were carefully studied both by myself and by my colleague, Dr. Joseph Collins, who rendered me valuable assistance. There were no disorders of taste, smell, vision, or hearing. There were no motor paralyses and no derangements of sensibility. There was neither word-blindness nor motor aphasia. He could talk and voluntarily say all words, except the names of objects and persons. He could say his own name readily, and did so whenever asked to. He readily recognized all objects he saw, and indicated by appropriate gestures that he understood what they were and what they were used for, but he could not say the name of a single one, even when he was told what the name was. When shown a cup and asked if he knew what it was, he said, "Yes, sir; yes, sir," and raised it to his lips. When told to describe how he got hurt he said: "I was struck on the; yes sir; here, sir [pointing to his head], by [after an attempt to remember the name of the person who struck him] an acquaintance. He hit me with a" [here a pantomime illustrating the size of the implement he was struck with].

---

*Read at the twenty-fifth annual meeting of the American Neurological Association, June 14 and 15, 1899.

He could copy writing and printing, and understood both readily. When I wrote: "Put out your right forefinger and touch the third button on my vest," he read it readily and immediately complied. When told to write such words as "cat," and horse," he wrote "crat" and "heort." He also made errors when told to say or write the alphabet. An ophthalmoscopic examination made by Dr. Collins showed slight choked disc in the right eye.

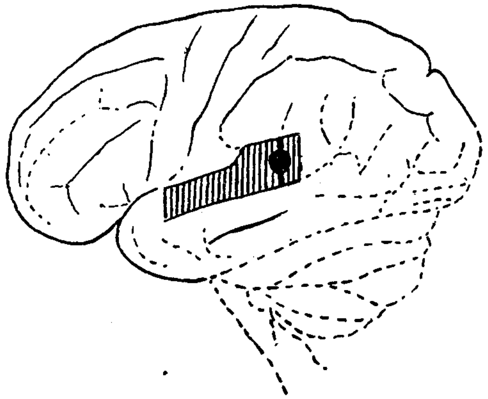

Diagram showing the location of the lesion in the superior temporal gyrus.

The diagnosis was made of subdural hemorrhage over the posterior portion of the superior temporal convolution.

An operation was performed by Dr. Seneca D. Powell, two weeks after the injury. I will not enter into the details of the operation now. Suffice it to say that a linear fracture was found in the left temporal bone, and that a subdural clot was found which covered the entire superior temporal gyrus. At a point at about the junction of the posterior with the middle third of this gyrus, there was a hole into which a probe could be introduced to a depth of about an inch and a half at a right angle to the surface of the gyrus. This rupture of cerebral tissue was evidently caused by the pressure of blood, as it was certainly two and a half inches posterior to the fracture, and could hardly have been caused by the direct violence of the blow. The clot was removed. The patient made a good recovery. Four or five days later he began to make attempts to pronounce names. At first, the sounds he uttered, while wrong, bore a decided resemblance to the word he desired to say. Later he acquired greater accuracy, and now is able to recall the memory of the names of many objects and people.

It is generally admitted at the present time that the memories of word-images are stored in the posterior half of the superior temporal gyrus, probably also in the same portion of the middle gyrus, and not improbably in a small area of the inferior gyrus. As the ability to name objects and persons is a well-recognized faculty of the normal individual, it necessarily follows that there must be a cortical area in which the memories of names are stored. But does it necessarily follow that this is so invariably located in every person as to force us to recognize a certain and definite area as the cortical center for name memories? I do not believe it does. The first cells in the higher auditory center which begin to register the memory of words heard, register the memory of names. The first words the infant learns are names such as "papa," "mamma," "bow-wow," etc. These with other simple names for a considerable period of time constitute the child's entire vocabulary.

Can it be claimed that all of the cells in the higher auditory center in all infants develop simultaneously and with the same degree of perfection, and that therefore the cells in a particular and preordained part of the auditory word center are ready and prepared for the reception of name sounds and the memorizing of those words? Is it not more probable, yes even certain, that some cells are in a higher state of development than others, and that the cells which are most highly organized are the ones which will naturally register and retain the memories of names? These cells of superior development may be situated in any part of the higher auditory center. If this is the case the location of the group of cells in which name memories are stored, while being an integral part of the higher auditory center, might differ widely in different individuals. This view is borne out to a great extent by the diversity in the situation of the lesions discovered in the cases of anomia already reported.

While it must be admitted that the conception of a word often depends upon the simultaneous combination of several perceptions, and that any interference with one or more of these perceptions may prevent the conception of a name, nevertheless there must be a distinct collection of cells which retain name memories. This collection of cells forms the beginning of the higher auditory center, but it is never anything more than a part of that center, and as its topographical position probably varies in different brains, the attempt to create a distinct naming-center seems hardly justifiable.

MOTOR APHASIA.[1]

By J. Fraenkel, M.D., and B. Onuf, M.D.

The paper was based upon an analysis of one hundred and three necropsies reported in medical literature. It was claimed that the evidence was strongly against the view that the pathway went directly from Broca's center to the bulbar nerve nuclei. It was probable that the insula participated in the function of speech in a similar manner as did Broca's center. Attention was also called to a test used by them to demonstrate the preservation or abolition of internal language, and which was believed to be important for the distinction between cortical and subcortical motor aphasia, especially in illiterate persons.

ANOMIA AND PARANOMIA, WITH SOME CONSIDERATIONS REGARDING A NAMING CENTER IN THE TEMPORAL LOBE.[1]

By Charles K. Mills, M.D.

The details of a patient who was able to recognize objects by sight, hearing, touch, taste, and smell, but who as a rule could not name these objects, were first given. The patient, after an apoplectic seizure, developed this peculiar form of aphasia, apparently without any preceding paralysis or any other symptoms of focal lesion like visual blindness, hemianopsia, etc. When examined about nine years after the onset of the aphasia he had almost complete inability to name persons and objects which he was able to recognize through all his senses. He had also a marked form of paralexia or paranomia. When he attempted to read, although he understood what he was reading, he repeated an absurd formula of a few phrases. He had limited spontaneous speech; using even short sentences (without concrete nouns) correctly. He could write many single words correctly, sometimes misspelling. He held his pen or pencil correctly, and wrote such words as he did write with ease and firmness. He was not a motor agraphic. He was not word-blind or letter-blind. He could repeat a few letters (w, x, l). While the case was one of "optic aphasia," it was in reality more than this. Dr. Mills believed that the evidence was sufficient to warrant the view that destruction of a region more or less concentrated or diffused, and probably mid-temporal in location, would cause the phenomena observed in cases of anomia. While this was true, it did not follow that these speech disturbances could not be produced by lesions in other locations. Most of the regions, destruction of which would lead to inability to name persons and objects, had been summarized by Bramwell. Inability to name objects and persons might be due (*a*) to destruction of the "naming center," (*b*) destruction of the nerve fibers which passed from that naming center to the motor vocal speech center, or (*c*) destruction of the motor vocal speech center by which these impulses were emitted. To this enumeration he would add that anomia or paranomia with associated phenomena would also be produced by destruction of the sensory percept centers and tracts leading from these centers to the naming or concept center.

---

[1] Read at the twenty-fifth annual meeting of the American Neurological Association, June 14 and 15, 1899.

DISCUSSION.

Dr. Joseph Collins said that the subject was so very large and touched upon so many important topics that, owing to the limited time, he would have to confine his remarks to two or three points only. It was not incumbent upon him to say anything in regard to Dr. Hammond's case, although he had studied it with Dr. Hammond from the beginning. As Dr. Hammond presented the case, it was convincing. It seemed to Dr. Collins that if this case did anything at all, it absolutely contradicted the existence of an uniquely localized special naming center, for here we had a sharply delimited lesion of the supertemporal convolution, occupying a location immediately adjacent to the auditory percipient and memorial center, causing exquisite anomia. It would be interesting to Dr. Collins if Dr. Mills would explain why this person was unable to name objects when the object which he recognized was brought under the percipient cognizance of the various special senses. According to the teaching of Mills and Broadbent, the naming center in the case reported by Dr. Hammond was intact. The case that Dr. Mills reported was absolutely parallel to Dr. Hammond's case. Dr. Mills stated that his patient could not recognize objects, but that should not be interpreted that he could not name objects. It did not seem to Dr. Collins at all difficult to explain the symptoms in Dr. Mills' patient by a lesion that made an interruption between the auditory center and the visual center. So far as Dr. Collins could see, the arguments in favor of an autonomous naming center are lacking in psychological substantiation and devoid of anatomical support, and Dr. Mills had not put on record anything more convincing in his case than he had done heretofore. Before he asks us to accept his position he should bring forth a case that will uphold it, or he should make a more legitimate plea for the existence of a naming center. When we present a case with loss of capacity to put names to objects, and show that the lesion is in the auditory center, why does not that show there is no uniquely located naming center? We do not deny that there is a naming center, if one chooses to use such a word, but we do deny the position of a special naming center in the posterior part of the third temporal convolution. There is no special area of the cortex entering into the zone of language to which the name "naming center" can be given.

Dr. Mills had referred incidentally to the case reported recently by Gordinier, and Dr. Collins wished to say, although that point was not under discussion, that that case was no more convincing than was Charcot and Dutil's case. It seemed to Dr. Collins that in Gordinier's case, which presented during life Wernicke's hemianopic pupillary reaction, there must have been something more anatomically than was recorded.

Finally one word in regard to Drs. Fraenkel and Onuf's paper. Dr. Collins was unwilling to concede that it was any adequate test of the existence or intactness of the internal language to be able to pick out the fifth card as described by Drs. Fraenkel and Onuf. One could teach a parrot to do that in five days. In fact, it is just what the Italian's fortune-telling canary does. Dr. Collins would like very much to hear Dr.

Onuf's explanation of the psychical antecedents of picking out these cards, and wherein it required the existence of internal language. The Proust-Lichtheim test had serious limitations of application, but it seemed to Dr. Collins far better than the test of Fraenkel and Onuf.

Dr. E. D. Fisher said that if we ask our patients how they recollect a thing, some will tell us that they remember it best by associating it with the written picture, and others that they remember it best as they have heard it. We find this constantly in our study of children or in teaching of languages, etc., and this may have some bearing upon the question as to whether we shall find one fixed point for the naming center in the brain. Dr. Fisher did not see why we should expect to find such a center. While the case of Dr. Gordinier was a very important one, he would not, on the same grounds, expect to find that we have a center for writing. It does not settle the question any more than the cases that have been brought to our attention during the discussion had decided that there is a definite naming center.

Dr. W. G. Spiller agreed with Dr. Onuf tnat we must give up the word "'subcortical" in speaking of aphasia, as the case published by Dejerine and Sérieux had shown that the so-called subcortical sensory aphasia may result from a cortical lesion, and it seemed probable that pure motor aphasia might also result from a cortical lesion.

He had been discussing with Dr. H. M. Thomas, Drs. Fraenkel and Onuf's method of making out tracts and centers, by putting together the diagrams representing the areas of greatest degeneration in all the cases studied by them and determining from these the location of tracts and centers. The method was open to criticism. Many of the cases were studied macroscopically only, and important areas might have existed in tissue whose degeneration could only be detected by the microscope. If the cases studied macroscopically confirmed those studied microscopically the results would be more valuable. It must be remembered, however, that an important tract might be in an area only slightly degenerated, and yet the function of the tract be destroyed.

Dr. Spiller asked in what way, in testing pure motor aphasia, Drs. Fraenkel and Onuf's method with cards was superior to that made so well known by Lichtheim, and consisting in pressing the hand of the observer by the patient as many times as there were syllables in the test word.

Dr. Onuf replied that the method suggested by Dr. Fraenkel and himself was intended for illiterate persons to whom the method mentioned by Dr. Spiller was not applicable.

Dr. P. C. Knapp said he would hardly be willing to accept Dr. Mills' naming center, but he must object to the opinion brought forward by Dr. Hammond and Dr. Collins on the strength of the case reported by Dr. Hammond. The general experiences in injuries of the brain is that you cannot be certain of the lesion by considering it through a small trephine hole, or even a large hole. We know that in these cases there are often extensive lesions of the brain apart from the immediate site of the hemorrhage, and Dr. Hammond said that the hole in the temporal lobe was two inches or more in size, so that there may well have been contusion or laceration of a considerable portion of the brain beyond the site of the lesion.

In regard to the writing center, there was a point that Dr. Knapp thought had not been dwelt upon, and that is, that if there be a writing center, as he was inclined to believe, it is the last center to be evolved, and of course it does not exist in a great number of people, because only a small number of the human race are able to write at all. In a very large proportion of those who are able to write all the muscles of the body assist in writing—that is, the whole brain cortex, and not a small portion of it, is put into action.

Dr. Hammond said he had little to add except in reply to Dr. Knapp's criticism. In the operation in his case the bone was removed after several trephine-openings had been made and the communications sawed through with the electric saw, so that a piece of bone was removed of sufficient size to expose completely the fissure of Sylvius and the brain tissue about it. Several careful observers, as well as Dr. Collins and Dr. Hammond, saw the fissure of Sylvius and the superior temporal convolution, and located the different portions by careful experiments. A small hole was found in the brain substance that admitted a probe which passed directly in, a distance of an inch and a half. An important point which was worthy of mention was, that on the day following the operation the patient showed evidences of sugar in the urine, and the sugar was present for a few days only.

This was a well-marked case with a very definite lesion, and the man had anomia pure and simple. It seemed to Dr. Hammond that the situation of the so-called naming center was in this particular case clearly marked out, but it does not follow, by any means, that the naming center need be in the same position in every case. The naming center must be the nucleus of the higher auditory center. The child begins to learn names, and those names may be registered in the superior convolution in one case, and somewhere else in the higher auditory center in another case.

Dr. Onuf heartily coincided with Dr. Collins' view that we cannot speak of a naming center, and he believed that the function of naming an object is not a function of *one* region of the brain, but that several centers participate in it. This is confirmed by the behavior of the patients. Their principal defect lies in not being able to name *objects* either from sight or touch or other senses, and in the great difficulty of using names of objects in voluntary speech to convey their meaning. They usually describe the use of objects instead of naming them directly; otherwise they speak rather fluently, and this proves that it is not so much the naming faculty *in general* that is concerned, as that of naming *objects*. Moreover, these patients have no difficulty in repeating any names (also of objects) told them, and can usually also utter them in reading. This shows that the memories of names themselves are not destroyed, and that only their relation to other functions is disturbed. Dr. Onuf was, therefore, certain that the condition was due, not to the destruction of some center, but to the interruption of some connecting pathway between two or more centers, and especially the connection between the center of the auditory word images and the center of the visual memories of objects.

Dr. Collins had asked what association of ideas a man has in making the test mentioned by Fraenkel and himself. Probably Dr. Collins had misunderstood the meaning of the test. It was claimed that the patient is, according to the plan proposed, forced to make use of internal language, namely of counting in words. It was believed that if the test were applied with proper discrimination, the use of visual images by the patient, which of course would nullify its value, could be prevented.

Dr. Mills said that even his friends who opposed him were coming to the point of view that there was a naming center. The only difference seemed to be that they had half a dozen naming centers. Bramwell said it was a component part of the auditory center. Just so long as there were concepts, just so long must there be higher centers than the auditory percept center for their origination. This region was a higher evolution of the zone of language, and had been formed in the process of evolution.